

**REMARKS**

By the present amendment, claims 1 and 21 have been amended to incorporate the subject matter of claim 7, i.e., that the injection start time (OI) is between the first intake opening time (OA1) and the exhaust closing time (FE). Accordingly, claims 7, 13, 17 and 22 have been canceled.

Claims 1-2, 5-6, 8-12, 14-16, and 18-21 are pending in the present application. Claims 1 and 21 are the only independent claims.

**Art rejections**

In the Office Action, claims 1-2, 9-13, and 19-20 are rejected under 35 U.S.C. 102(b) as anticipated by WO0179675 to Beuche et al. (“Beuche”).

Further, claims 6-8 and 16-18 are rejected under 35 U.S.C. 103(a) as obvious over Beuche in view of US 6,386,177 to Urushihara et al. (“Urushihara”), claims 5 and 15 are also rejected under 35 U.S.C. 103(a) as obvious over Beuche in view of Urushihara, and claims 21-22 are also rejected under 35 U.S.C. 103(a) as obvious over Beuche in view of Ushihara.

It is submitted that there would have been no incentive or motivation to combine Beuche with Urushihara, because the systems of Beuche and Urushihara are very different from each other and from the present invention. In particular, Urushihara has an exhaust retaining phase at the TDC at the end of the exhaust phase whereas Beuche has both exhaust and intake valves open at that time. Therefore, a person of ordinary skill in the art would have found no guidance and no expectation of success in attempting a combination of Beuche and Urushihara.

In addition, even if, arguendo, a person of the art had found a motivation or incentive to

attempt such combination (which is denied), this would not have resulted in the presently claimed invention because in Urushihara, even the pre-injection during the 4<sup>th</sup> stroke is during a time when the exhaust valves have closed, as clearly shown on Figs. 5 and 13 of Urushihara.

More particularly, with reference to Fig. 5 of Urushihara, it is submitted that the “exhaust stroke” of Urushihara (which lasts until the TDC of the 4<sup>th</sup> stroke) is different from the “exhaust phase” which ends when the exhaust valves close, and that the “exhaust stroke” of Urushihara is defined broadly and includes time periods when the exhaust valves of Urushihara are closed.

In Figs. 5 and 13 of Urushihara, the “exhaust stroke” (4<sup>th</sup> stroke) is shown at the top and the “exhaust phase” (exhaust valves open) is shown at the bottom. Thus, in Urushihara, the “exhaust phase” (closing of exhaust valves) clearly ends before pre-injection.

Further, Beuche does not provide any further information in this respect.

In contrast, in the presently claimed invention, the injection start time (OI) is between the first intake opening time (OA1) and the exhaust closing time (FE), as recited in present claims 1 and 21. An advantage of this feature is that injection start time can be set during the “scavenging time” as explained at page 7 of the present application, and as illustrated in reference to the embodiments of Figs. 8-10.

The features of the presently claimed invention and their advantages are not taught or suggested in Urushihara, and the other cited references fail to remedy this deficiency. Therefore, the present claims are not obvious over the cited references taken alone or in any combination.

Amendment  
U.S. Appl. No.: **10/562,417**  
Attorney Docket No. **PSA0307692**

In addition, with respect to the dependent claims, it is submitted that the cited references fails to teach or suggest the combined features of these respective claims. Therefore, each of these respective claims is not obvious over the cited references taken alone or in any combination.

In view of the above, it is submitted that the rejections should be withdrawn.

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

In the event there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to our Deposit Account No. 502759.

Respectfully submitted,

/nicolas seckel/

---

Nicolas E. Seckel  
Attorney for Applicants  
Registration No. 44,373

Nicolas E. Seckel  
Patent Attorney  
1250 Connecticut Avenue, NW Suite 700  
Washington, DC 20036  
Tel: 202-669-5169  
Fax: 202-822-1257  
Customer No.: 29980  
NES/rep